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Service learning + math = good equation

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Summary: The research of four faculty and staff - Jon Anderson, Peh Ng, Engin Sungur and Ben Winchester - is showcased in a recently published book, the first of its kind about incorporating a service-learning component into college mathematics courses.

(February 3, 2006)-The research of four University of Minnesota, Morris faculty and staff is showcased in a recently published book, the first of its kind about incorporating a service-learning component into college mathematics courses. The work of Peh Ng (associate professor of mathematics), Engin Sungur (professor of statistics), Jon Anderson (associate professor of mathematics) and Ben Winchester (Center for Small Towns) is included in *Mathematics in Service to the Community: Concepts and Models for Service-Learning in the Mathematical Sciences*. The book, published in September 2005 by The Mathematical Association of America, is the first to look at "the wide variety of ways in which mathematics, statistics and mathematics education teachers have incorporated service-learning into their courses," said the book's summary. "The book also speculates about heretofore untapped possibilities for service-learning." The chapters are written by authors from colleges and universities nationwide.

Ng's research is profiled in the chapter, "Designing Efficient Snow Plow Routes: A Service-Learning Project." The chapter features just one of several projects that Ng and her students researched. The project was of particular interest to and had significant value for the City of Morris, the small community in which UMM is located. The class was asked to determine and design "a cost-effective way to plow the streets and alleys so that each of the different types of snow plows and sanding trucks could traverse its group of streets and return to its depot."

"It was an honor when the editor invited me to write a subchapter for the text," said Ng. "The fact that there were two subchapters in the book that were written by UMM faculty and staff says a lot about UMM's commitment to service learning."

If you randomly ask any person affiliated with service learning at colleges/universities to 'describe a few examples of service learning,' " said, Ng, "by and large, you will not hear examples related to the mathematical sciences in their responses. This book is long overdue in particular, it is a dissemination of a plethora of mathematical modeling and applications that are actually useful in the vicinity of a college campus.

"The fact that this text was published by one of the largest mathematical societies in the nation, namely the Mathematical Association of America (MAA), shows that its contents are valued by the mathematical community and that there is potential for other mathematical science departments to incorporate similar project in their communities," said Ng.

"[The inclusion of UMM in the book] is an indicator for me of the shift in higher education toward establishing a relationship with the public in ways never before seen," said Winchester, who is the coordinator for data analysis and research for the Center for Small Towns. "These articles show that service learning, and more broadly, civic learning, is occurring in our small, rural place which can provide knowledge for others. When we began, it seemed a natural,

in-front-of-your-face kind of thing to do."

The work of Sungur, Anderson and Winchester is told in "Integration of Service-Learning into Statistics Education." Winchester also provided support for Ng's snow-plow route research.

Sungur's "Design of Experiments" course explored the experimental process using a multitude of data analysis techniques that vary depending on the data and expected outcomes. Anderson's "Statistical Data Analysis" course involved a number of statistical techniques. The class examined time trends in industrial employment, unemployment, and social service program trends in Stevens County.

"UMM faculty have long been involved in educating students with a lean toward civic learning," added Winchester. "It is only in the past 10 years that these types of contributions have been officially recognized. Small industry has sprouted, dedicated to facilitating student, faculty, staff and programmatic connections between the university and community. This has led to an increased responsiveness by the university to the town in which it is situated.

"The students' learning of statistical concepts is enhanced, there is an elevated motivation and sense of ownership, and a greater appreciation of the application of mathematical and statistical methods in everyday life. Community groups have benefited directly from data analysis services," said Winchester.

The book is available from the MAA, most online bookstores and at UMM's Briggs Library.